

# **DIFFERENTIAL DENSE WAVELENGTH DIVISION MULTIPLEXING (DDWDM) IN OPTICAL SYSTEMS**

## **Abstract of Disclosure**

An apparatus provides an optical wavelength division multiplexed signal having  $2M$  optical channels such that each of  $M$  information-bearing signals are differentially encoded onto 2 of the  $2M$  optical channels. In particular, the apparatus comprises  $M$  inverters,  $2M$  electrical-to-optical converters and a multiplexer. Each electrical-to-optical converter provides an optical signal at a different one of  $2M$  wavelengths. The apparatus receives the  $M$  information-bearing signals and (a) creates  $M$  optical signals, each at a different wavelength, by converting each of the  $M$  information bearing signals into the optical domain via  $M$  of the  $2M$  electrical-to-optical converters, and (b) creates  $M$  inverted optical signals, each at a different wavelength, by first inverting each of the  $M$  information bearing signals (via the  $M$  inverters) before conversion into the optical domain via the remaining  $M$  electrical-to-optical converters. The  $M$  optical signals along with the  $M$  inverted optical signals are then applied to the multiplexer, which provides an optical wavelength division multiplexed (WDM) signal having  $2M$  channels.

## Figures

Figure 1: A line graph showing the relationship between the number of figures and the number of pages. The x-axis is labeled 'Number of Figures' and ranges from 0 to 10. The y-axis is labeled 'Number of Pages' and ranges from 0 to 10. The data points are as follows:

Number of Figures	Number of Pages
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10